

Algebra 1: 6.2 HW
 Linear Combinations/Elimination Method

Name Answer Key

Write a system of equations to represent each problem situation. Solve the system of equations using the linear combinations/elimination method.

1. The high school marching band is selling fruit baskets as a fundraiser. They sell a large basket containing 10 apples and 15 oranges for \$20. They sell a small basket containing 5 apples and 6 oranges for \$8.50. How much is the marching band charging for each apple and each orange?

x = cost of each apple
 y = cost of each orange

$$\begin{array}{r} 10x + 15y = 20 \\ -10x - 12y = -17 \\ \hline \end{array}$$

$$\begin{array}{r} 10x + 15(1) = 20 \\ 10x = 5 \end{array}$$

$$10x + 15y = 20$$

$$5x + 6y = 8.50 \times (-2)$$

$$3y = 3$$

$$y = 1$$

$$x = 0.50$$

$$(0.50, 1)$$

The band charges \$0.50 per apple and \$1 per orange.

2. Asna works on a shipping dock at a tire manufacturing plant. She loads a pallet with 4 Mudslinger tires and 6 Roadripper tires. The tires on the pallet weigh 212 pounds. She loads a second pallet with 7 Mudslinger tires and 2 Roadripper tires. The tires on the second pallet weigh 184 pounds. How much does each Mudslinger tire and each Roadripper tire weigh?

x = weight of the Mudslinger tire
 y = weight of the Roadripper tire

$$\begin{array}{r} 4x + 6y = 212 \\ -21x - 6y = -552 \\ \hline \end{array}$$

$$\begin{array}{r} 4(20) + 6y = 212 \\ 80 + 6y = 212 \end{array}$$

$$4x + 6y = 212$$

$$7x + 2y = 184 \times (-3)$$

$$-17x = -340$$

$$x = 20$$

$$6y = 132$$

$$y = 22$$

$$(20, 22)$$

Each Mudslinger tire weighs 20 pounds, and each Roadripper tire weighs 22 pounds.

Solve each system of equations using the linear combinations method.

$$3. \begin{cases} 3x + 5y = 8 \\ 2x - 5y = 22 \end{cases}$$

$$5x = 30$$

$$x = 6$$

$$3(6) + 5y = 8$$

$$18 + 5y = 8$$

$$5y = -10$$

$$y = -2$$

$$(6, -2)$$

$$4. \begin{cases} 4x - y = 2 \\ 2x + 2y = 26 \end{cases} \quad \times 2$$

$$2(4x - y = 2)$$

$$2x + 2y = 26$$

$$8x - 2y = 4$$

$$2x + 2y = 26$$

$$10x = 30$$

$$x = 3$$

$$2(3) + 2y = 26$$

$$6 + 2y = 26$$

$$2y = 20$$

$$y = 10$$

$$(3, 10)$$

$$5. \begin{cases} 10x - 6y = -6 \\ 5x - 5y = 5 \end{cases} \times (-2)$$

$$\begin{array}{r} 10x - 6y = -6 \\ -10x + 10y = -10 \\ \hline \end{array}$$

$$4y = -16$$

$$y = -4$$

$$5x - 5(-4) = 5$$

$$5x + 20 = 5$$

$$5x = -15$$

$$x = -3 \quad (-3, -4)$$

$$7. \begin{cases} 2x - 4y = 4 & \times 3 \\ -3x + 10y = 14 & \times 2 \end{cases}$$

$$\begin{array}{r} 6x - 12y = 12 \\ -6x + 20y = 28 \\ \hline \end{array}$$

$$8y = 40$$

$$y = 5$$

$$2x - 4(5) = 4$$

$$2x - 20 = 4$$

$$2x = 24$$

$$x = 12$$

$$(12, 5)$$

$$6. \begin{cases} x + 6y = 11 & \times 2 \\ 2x - 12y = 10 \end{cases}$$

$$2x + 12y = 22$$

$$2x - 12y = 10$$

$$\hline 4x = 32$$

$$x = 8$$

$$8 + 6y = 11$$

$$6y = 3$$

$$y = 0.5$$

$$(8, 0.5)$$

$$8. \begin{cases} \frac{3}{4}x + \frac{1}{2}y = -\frac{3}{4} & \times 4 \\ \frac{2}{3}x + \frac{2}{3}y = \frac{2}{3} & \times 3 \end{cases}$$

$$3x + 2y = -3$$

$$\times 2x + 2y = 2 \quad \times (-1)$$

$$3x + 2y = -3$$

$$-2x - 2y = -2$$

$$\hline x = -5$$

$$\times 2(-5) + 2y = 2$$

$$-10 + 2y = 2$$

$$2y = 12$$

$$y = 6 \quad (-5, 6)$$

9. The Pizza Barn sells one customer 3 large pepperoni pizzas and 2 orders of breadsticks for \$30. They sell another customer 4 large pepperoni pizzas and 3 orders of breadsticks for \$41. How much does the Pizza Barn charge for each pepperoni pizza and each order of breadsticks?

x = cost of each pepperoni pizza

y = cost of each order of breadsticks

$$3x + 2y = 30 \quad \times 3$$

$$4x + 3y = 41 \quad \times (-2)$$

$$9x + 6y = 90$$

$$-8x - 6y = -82$$

$$\hline x = 8$$

$$3(8) + 2y = 30$$

$$24 + 2y = 30$$

$$2y = 6$$

$$y = 3$$

$$(8, 3)$$

The Pizza Barn charges \$8 for each pepperoni pizza and \$3 for each order of breadsticks.